-- However, it was further observed that the shelf life of at least the 28 wt% embodiment of these above mixtures (represented as Run 1 below) was less than optimal for use in vertebroplasty. In particular, embodiments which were aged up to 6 months displayed significantly higher setting times than similar non-aged embodiments, thereby demonstrating that this embodiment possessed a short shelf-life. Accordingly, three additional formulations (Runs 2-4 below) of barium sulfate-containing bone cement were evaluated, and these approximate formulations are presented in Table II below:--

Q1

At page 31, beginning at line 10, please replace the as-filed paragraph with the following replacement paragraph:

--In addition, review of TABLE IV indicates that the increased $BaSO_4$ concentrations in the mixtures of the present invention yield longer setting times (about 18-20 minutes) than those of cements having lower contrast agent fractions, such as the 16.67 wt% embodiment of Table I (about 17 1/4 minutes). Long setting times are attractive for vertebroplastic bone cements because, in use, the cement must be able to suitably flow from the injection gun through a small tube to the vertebral body, and then refrain from leaking from the vertebral body once it is in place. Accordingly, a vertebroplastic cement should avoid setting for at least 10 minutes, and more preferably for much longer time periods such as 14-20 minutes, with some embodiments being in the range of 18-20 minutes. Most conventional orthopaedic barium sulfate-containing bone cements typically have setting times on the order of 8-12 minutes, and so are inadequate for this application. Combs reported setting times of no more than only 15 minutes, albeit at an ambient temperature of about 30 °C. Without wishing to be tied to a theory, it is believed that the reason for Jensen's selection of "slow setting" Cranioplastic as the base material for a vertebroplastic cement could have been this long setting time feature. However, TABLE I indicates that the 16.5-18.8 wt% mixtures described by Jensen probably had setting times of about 17 1/4 minutes.--

Q2

At page 37, lines 4-6, please delete the entire paragraph which reads:

"Accordingly, Applicants have discovered that using coarse (>2 um) barium sulfate grains not only solves the problem of satbility, but also provides sufficient contrast capability and periphery detection precision necessary for use in vertebroplasty."

G3

At page 37, beginning at line 10, please replace the as-filed paragraph with the following replacement paragraph:

--Therefore, in accordance with the present invention, there is provided a powder mixture for producing bone cement, the mixture comprising contrast agent grains (preferably, barium sulfate grains) having a D_{50} grain size of at least 3 μm, more preferably at least 5 μm, and most preferably at least 10 μm. In some embodiments, the D_{50} grain size is between 6 and 14 μm. These coarse grain embodiments provide particular advantage to high $BaSO_4$-containing powder mixtures, such as those powder mixtures comprising between 20 wt% and 40 wt% $BaSO_4$ in that the coarse grains do not form strength-degrading agglomerates. Preferably, the $BaSO_4$ grains are not embedded within the PMMA powder. In preferred embodiments of powder mixtures containing coarse, high wt% $BaSO_4$ powder, more than 50 wt% of the BPO is unbound or "free" (preferably, at least 75 wt%). Free BPO is advantageous over bound BPO in that it can more quickly initiate the bone cement polymerization reaction, and so help adjust desired setting times. --

G4

At page 39, beginning at line 13, please replace the as-filed paragraph with the following replacement paragraph:

--Next, it was further found that replacing barium sulfate with zirconia grains in the powder mixture also produced a bone cement mixture having sufficient radio-opacity and shelf life. In particular, one cement of the present invention containing about 20 wt% monoclinic zirconia was found to have the following mechanical properties:

G5